Claims

What is claimed is:

1) A method for providing a sustained release of a dose of a pharmaceutical agent, comprising the steps of:

a) providing a member selected from a suture, a staple, a dental implant, clip or a member including a lumen; and

b) applying to the implant a sustained release medium and a pharmaceutical agent selected from an antimicrobial, an antithrombotic, an antiseptic, an antifungal, a chelating, an anticoagulant, antibiotic, an anti-inflammatory, a steroid, an antiglaucomatous or a combination thereof.

2) The method of claim 1, wherein the sustained release medium and the pharmaceutical layer is applied for defining a multi-layered structure, a structure having the pharmaceutical agent dispersed in the sustained release medium or a combination thereof;

wherein the sustained release medium is applied to optionally define a barrier layer over at least one region of a pharmaceutical agent;

wherein the sustained release medium comprises a material provided in a state selected from solid, semi-solid, liquid, gel, amorphous solid, crystalline solid, freeze dried, spray-dried, or supercooled;

wherein over a major portion of its length, the outer surface of the member has the sustained release medium and the pharmaceutical agent applied thereto, and is selected from a smooth surface an irregular surface, a stepped surface, a tapered surface, a surface having no slope or a combination thereof;

wherein at least one of the sustained release medium, the pharmaceutical agent, or a combination of both, is applied to the implant by a step including, spraying, dipping, swabbing, brushing, rolling, curtain coating, doctor blading, vapor deposition or combinations thereof;

wherein the pharmaceutical agent is applied to the member along the length of the implant as a continuous layer or an intermittent layer;

wherein the pharmaceutical agent is optionally applied to the member by producing a mixture that includes at least one porogenic agent, compacting or shaping the mixture to its desired form, treating the product obtained in such a way that the porogen is removed, and introducing pharmaceutical agent where the porogen used to be; and

wherein the pharmaceutical agent is applied to the member at a surgical site with a dispensing device for applying the pharmaceutical agent with the sustained release medium or at a site remote from the surgical site.

3) An implantable device having a pharmaceutical agent adapted for sustained release therein, comprising:

a) an elongated hollow member having a plurality of openings formed along its length;

b) a pharmaceutical agent disposed within the hollow member; selected from an antimicrobial, an antithrombotic, an antiseptic, an antifungal, a chelating, an anticoagulant, antibiotic, an anti-inflammatory, a steroid, an antiglaucomatous or a combination thereof; and

c) a layer including a sustained release medium that diminishes in size over time when implanted in a body for exposing the openings and releasing the pharmaceutical agent.

4) The device of claim 3, wherein the openings vary is size or shape along the length of the member.

5) The device of claim 3 wherein the sustained release medium comprises a material provided in a state selected from solid, semi-solid, liquid, gel, amorphous solid, crystalline solid, freeze dried, spray-dried, or supercooled,

6) The device of claim 3, wherein over a major portion of its length, the outer surface of the member has the sustained release medium and the pharmaceutical agent applied thereto, and is selected from a smooth surface an irregular surface, a stepped surface, a tapered surface, a surface having no slope or a combination thereof.

7) The device of claim 5, wherein over a major portion of its length, the outer surface of the member has the sustained release medium and the pharmaceutical agent applied thereto, and is selected from a smooth surface an irregular surface, a stepped surface, a tapered surface, a surface having no slope or a combination thereof.

8) The device of claim 3, further comprising a detectable marker.

9) The device of claim 6, further comprising a detectable marker.

10) The device of claim 7, wherein the sustained release medium is selected from caprolactones (e.g., a polyactide-coglycolide-co-caprolactone (PGLC) polymer), multivesicular liposomes (e.g., with unilamellar vesicles, mutilamellar vesicles, neosomes, closely packed non-concentric vesicles (such as DEPOFOAM™), or combinations thereof), salts (e.g., an ammonium salt of 1-0- hexadecylpropanediol-3-phospho-ganiclovir (HDP-P-GCV)), poly(lactic acid), poly (glycolic acid), copolymers of lactic and glycolic acids, poly (DL-lactide-co-glycolide) (PLGA) or blends of PLGA of different molecular weights, poly (orthoester), acrylic polymers, methacrylic polymers, poly (hydroxyethylmethacrylate), polysulfone or mixtures thereof.

11) An implantable device, comprising:

a) an implantable elongated hollow member including a lumen;

b) a sustained release medium within the interior of the lumen for changing dimensions over time as matter is passed through the lumen.

12) The device of claim 11, wherein the elongated hollow includes a lumen section shaped as a rectangle, a circle, or a triangle.

13) The device of claim 11, wherein the lumen has a rectangular section and the sustained release medium is adapted to increase a rate of flow through the lumen linearly over time.

14) The device of claim 11, wherein the lumen has a circular section and the sustained release medium is adapted to increase a rate of flow through the lumen over time followed by a period of slower increase of flow rate.

15) The device of claim 11, wherein the lumen has a triangular section and the sustained release medium is adapted so that the rate of increase of flow gradually decreases.

16) The device of claim 11, wherein the lumen has a triangular section and the sustained release medium is adapted so that the rate of increase of flow gradually increases.

17) The device of claim 11 wherein the member has a fixed inner and outer dimension, the member includes a plurality of openings of a fixed size and shape, and the sustained release medium comprises a material provided in a state selected from solid, semi-solid, liquid, gel, amorphous solid, crystalline solid, freeze dried, spray-dried, or supercooled.

18) The device of claim 17 further comprising a pharmaceutical agent combined with the sustained release medium selected from an antimicrobial, an antithrombotic, an antiseptic, an antifungal, a chelating, an anticoagulant, antibiotic, an anti-inflammatory, a steroid, an antiglaucomatous or a combination thereof.

19) The device of claim 17 wherein the sustained release medium is selected from caprolactones (e.g., a polyactide-coglycolide-co-caprolactone (PGLC) polymer), multivesicular liposomes (e.g., with unilamellar vesicles, mutilamellar vesicles, neosomes, closely packed non-concentric vesicles (such as DEPOFOAM™), or combinations thereof), salts (e.g., an ammonium salt of 1-0- hexadecylpropanediol-3-phospho-ganiclovir (HDP-P-GCV)), poly(lactic acid), poly (glycolic acid), copolymers of lactic and glycolic acids, poly (DL-lactide-co-glycolide) (PLGA) or blends of PLGA of different molecular weights, poly (orthoester), acrylic polymers, methacrylic polymers, poly (hydroxyethylmethacrylate), polysulfone or mixtures thereof.

20) The device of claim 18 wherein the sustained release medium is selected from caprolactones (e.g., a polyactide-coglycolide-co-caprolactone (PGLC) polymer), multivesicular liposomes (e.g., with unilamellar vesicles, mutilamellar vesicles, neosomes, closely packed non-concentric vesicles (such as DEPOFOAM™), or combinations thereof), salts (e.g., an ammonium salt of 1-0- hexadecylpropanediol-3-phospho-ganiclovir (HDP-P-GCV)), poly(lactic acid), poly (glycolic acid), copolymers of lactic and glycolic acids, poly (DL-lactide-co-glycolide) (PLGA) or blends of PLGA of different molecular weights, poly (orthoester), acrylic polymers, methacrylic

polymers, poly (hydroxyethylmethacrylate), polysulfone or mixtures thereof.